Higher Check In - 1.04 Inverse operations

Fill in the missing values.

1. $\square^3 = 343$

2. $\dfrac{\square}{16 - 3^2} = 5$

3. $5 + \dfrac{24}{\sqrt{\square} + 1} = 11$

4. $\sqrt{\dfrac{22}{\square^4 + 7}} = \dfrac{1}{2}$

5. The reciprocal of a number is $1\frac{2}{3}$. What is the number?

6. Given that $x^3 = \dfrac{1}{512}$ and $y = \dfrac{1}{\sqrt[3]{x}}$, show that $y = 2$.

7. Ruth thinks of a number. She multiplies it by 5, adds 3 to it and then multiplies it by itself three times. The answer is 8. Explain how to find Ruth's original number.

8. The mean weight of a bag of 5 apples is 73 g. Another apple is added to the bag and the new mean weight is 75 g. Show that the weight of the added apple is 85 g.

9. A cylindrical tube has a volume of 108 cm^3 and a length of 16 cm. Find the radius of the cylinder to 2 dp.
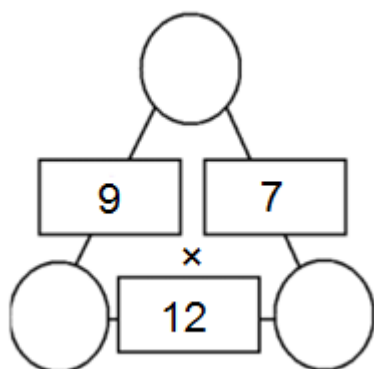
10. Peter wants to invest £500 for 10 years. Use the equation $1000 = 500\left(1 + \dfrac{i}{100}\right)^{10}$ to find the annual rate of compound interest (i) needed for Peter's investment to be worth £1000 at the end of 10 years.

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Extension
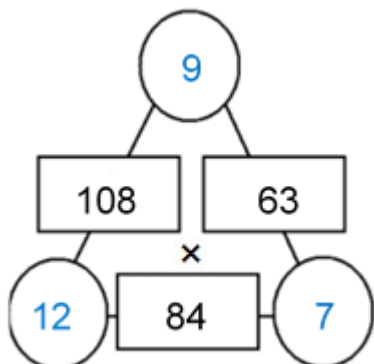
This is an arithmagon. The numbers in the square boxes are made by multiplying the numbers in the circles on either side.

This is also an arithmagon. Can you work out what numbers go in the blank circles?

Make some of your own arithmagons.

Answers

1. 7

2. 35

3. 9

4. 3

5. $\dfrac{3}{5}$ or 0.6

6. $x = \dfrac{1}{\sqrt[3]{512}} = \dfrac{1}{8}$ so $\sqrt[3]{x} = \dfrac{1}{2}$ and therefore $y = 2$

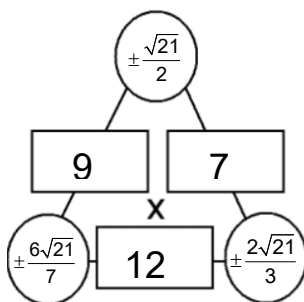7. Cube root 8, subtract 3 and then divide the number by 5 e.g. $\dfrac{\sqrt[3]{8} - 3}{5} = -\dfrac{1}{5}$

8. 73 × 5 = 365 g, 75 × 6 = 450 g, added apple = 450 − 365 = 85 g

9. $V = \pi r^2 h$

   $r = \sqrt{\dfrac{V}{\pi h}} = \sqrt{\dfrac{108}{16\pi}} = 1.47$ cm

10. 7.2%

Extension

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Solve one step equation involving cubing			
AO1	2	Rearrange calculation using inverse operations			
AO1	3	Rearrange calculation using inverse operations			
AO1	4	Solve multi-step equation by using inverse operations			
AO1	5	Find a reciprocal			
AO2	6	Deduce given solution using inverse operations			
AO2	7	Communicate solution involving inverse operations			
AO2	8	Communicate solution involving inverse operations			
AO3	9	Solve geometric problem using inverse operations			
AO3	10	Solve a problem in context using inverse operations			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1				
AO1	2				
AO1	3				
AO1	4				
AO1	5				
AO2	6				
AO2	7				
AO2	8				
AO3	9				
AO3	10				

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